Chapter 1 Introduction

1.1 Introduction

The basic function of commodities derivative market is price discovery and hedging of the price risk. India being largely an agriculture based economy, a significant rise in agriculture commodity exports is observed; its share in overall export basket has seen an increasing trend and was approximately at 12.3% for FY2011-2012 (Division of International Trade and Finance, 2012). Government has set ambitious target of USD 70 billion for commodity export until FY2017.

Agriculture commodity futures are financial products which should help the producer / consumer in managing their price risk relating to agriculture product and establish an efficient market. Markets should help in better price discovery by providing a forum to exchange information on supply and demand scenario of the agriculture product.

In a world where largest taxi company does not own any taxi (Uber), world largest accommodation provider does not own any real estate (Airbnb), few world’s leading retail chain do not hold inventory in their own warehouse (Alibaba etc.); where everyone is trying to make profit on other people product why can’t a farmer make profit without farming or at least benefit by hedging the price risk? Unfortunately for this to happen in India we need to have farmer who are educated on derivative products and functioning of commodity exchanges.

Indian farmers largely can be classified as ignorant about the technological advancement in the commodity exchanges, relative benefits offered and hedging strategies. They primarily juggle with various risks inherent in the agriculture commodities like price variability due to supply side shocks resulting from crop disease, weather conditions, etc., high input prices of seeds, fertilizers and agro-chemicals and long supply chain with presence of many intermediate parties.
In Agriculture commodity bulk of profit is made by the trader and hoarder who have financial muscles and farmers are forced to sell their produce in penny. Large part of agriculture business is underdeveloped due to government intervention in many agriculture commodities.

Farming is hugely dependent on rainfall and so they are the only sufferers when there is a draught or untimely rain. Farmer suicides are common as they are unable to service loans and social humiliation forces them to take such measure. In India agriculture is the means of livelihood for 58% of population and it contributes 20% to the GDP. India has the third largest land bank in the world but the yields are low as 56% of India agriculture is dependent on rainfall. All these factors lead to decrease in margins and poses serious question about the wellbeing of farming community in India.

Trading on commodity exchanges primarily was thought to be a tool for price discovery. It has seen interest from different work groups like traders, speculators, arbitrageurs, processors/manufacturers, investors etc. Although the benefits of future market have been appraised by many; there is still certain section of population that critic the usefulness and suitability of the futures market as an engine for growth of agriculture commodity market due to excessive speculative activities (Varadi, 2012). Further in case of agriculture commodities, the Government intervention by fixing the minimum support price is also expected to give rise to inefficiency (Kaur & Rao, 2010). An attempt is made by undertaking the study to analyze the performance of future market with reference to Agriculture commodities. High volatility in agriculture commodity prices are underpinned by demand side pull and the supply side not being able to match-up; being highly dependent on weather conditions, seasonality and macroeconomic factors. All these increase the need for well-established market place to determine the prices and transfer the risk of price fluctuation. This justifies the functioning of commodity derivative markets. However, it is argued many times that derivative markets do not play the role they are supposed to play in risk transfer i.e. hedging. This will be proving correct if the markets are not efficient. Achievement of the Future’s markets in stabilizing the spot market will prove its efficiency. An attempt will be made in the study, to test market efficiency with reference to the lead-lag relationship between spot and futures price of agriculture commodities. This chapter introduces the concept of derivatives, products and classification of markets. It also highlights the evolution and current status along with regulatory framework for Indian commodity exchange.
1.2 Concept and Classification of Derivative Market

In common parlance, the word “Derivative” is a contract whose price is derived from the underlying asset. Securities Contract Regulation Act, 1956 defines the term “derivative” as –

“i. a security derived from debt instrument, share, loan, whether secured or unsecured, risk instrument or contract for differences or any other form of security;

ii. a contract which derives its value from the prices, or index of prices, of underlying securities.”

Thus derivative can be understood to be a contract whose value is derived from the “underlying”. The underlying can take any of the following forms or even others based on the risk that its holding can mitigate.

1. Agriculture derivatives covering cereals, pulses, spices, oil seeds, oils, etc.
2. Industrial metals like Copper, Zinc, Aluminium, nickel, etc.
3. Precious metals like Gold, Silver, etc.
4. Energy products like Crude Oil, Natural Gas, Carbon Credits, etc.

The trade in the derivative contracts takes place with investment of margin which keeps fluctuating with the price of underlying.

The trade in commodities market can be classified into two broad categories-

1. Spot market – This is the physical market place where the buyer and seller negotiate on the price and quality of the goods. “Immediate Delivery” phenomenon applies to the spot market.

2. Derivative market – The commodities can be bought or sold in derivative market as well. This market is further classified as Over the Counter market (OTC) and Exchange Traded derivative market.

The Over-the-Counter trade means entering in a contract which is negotiated and traded privately between parties to the contract. The OTC market offers non-standardized derivative contracts like forward, swaps, options, etc. which are not traded on exchange and largely involves financial players, hedge funds, bankers that
Offer these products to the parties to meet specific demands.

On the other hand, Exchange traded derivatives are standardized contracts traded on derivative exchanges. Commodity derivative markets saw a tremendous spurt in the volumes; some time back they used to be just a small proportion of global derivative markets which was leading by currencies, stocks, interest rates, etc.

1.3 Types of Derivative Contracts

The most important derivative contracts are

i. Forward contract

ii. Futures Contract

iii. Options contract

All the National commodity exchanges offer only Futures contract as options are yet not permitted for commodity trade. Recently exchange traded forwards (ETF) are also offered.

i. Forward Contract – Forward contracts are unstandardized contract between two parties generally traded over the counter exchange in India. They expose the parties to the contract to counter-party risk i.e. the risk of default in meeting of the agreed obligations by either of the party.

ii. Future Contracts – Future contracts are standardized contracts traded on exchange to buy or sell certain commodities at agreed upon price in future. These are traded on commodity/stock exchanges thus eliminating the risk of counter-party default as well as the risk of sub-standard delivery.

iii. Options Contract – Options contract gives the parties to the contract an option to either buy or sell the underlying commodity at a specified price. Option contracts are not available for trade on commodity exchanges in India.

iv. Swap Contracts – An agreement between two parties to exchange the cash flows on or before a specified future date based on the underlying like currencies, commodities, etc. Swaps are not traded on exchange.
1.4 Evolution of Derivative Markets in India: A Historic Insight

Agriculture commodity future market was set up to basically protect the farmers from change in price movements, but due to the education levels of farmer the most active trading in commodity market takes place by group of elite commodity trader/brokers. Essential commodity act 1955 also restricts free trade in many essential commodities (Essential Commodities Act, 1955). In 2003, Government of India removed all restriction on commodities and made free commodity trading a reality.

Bombay cotton trade association was the first organized future contract trading platform established in 1875. This was followed by the establishment of East India Cotton Association in 1923 for trading cotton futures contract. Futures’ trading was conducted in many commodities including precious metals (gold, silver), agriculture commodities (Jute, cotton, sugar, wheat, rice, etc.), edible oils etc. However with the outbreak of Second World War in 1939, Government banned trading in many commodities due to short supply by Defense of India Act. (Forward Market Commission (2013))

A landmark step of enacting the Forward Contracts (Regulation) Act was made in 1952. In 1953, Forward Markets Commission was set-up and this regulated the forward contracts in commodities all over India. Government again imposed a ban on futures trading in mid-1960 for most of the commodities. The Khusro committee recommendations lead to start of futures trading in certain commodities in 1980s.

India entered the liberalization era in 1991 and in 1994 Kabra committee recommended opening up of futures trading in 17 commodities. The Government permitted establishment of three National level Multi-commodity exchanges in India in FY2003 (Refer to Figure 1.1).

Apart from these three national exchanges, further other three exchanges were provided recognition in staggered manner in 2009, 2010 and 2012. There are many regional commodity exchanges. Some regional commodity exchanges trade in all commodities while other regional exchanges deal in only few commodities. The figure 1.1 below gives the names of various national and regional exchanges.
1.5 Current Status of Indian Commodity Market

In the period from 2005 and onwards there was a sizeable increase on the volumes of trade on commodity exchanges. The size of commodity futures market recorded a compounded annual growth rate of nearly 40% since 2003 and the volumes reached to Rs. 170,468 billion 2012-2013. Large volumes registered on exchanges hinted towards the increase in speculative trade. The composition of trade underwent a massive change on the Indian commodity exchanges. Earlier agriculture commodities by value of trade accounted for nearly 69% of total trade recorded at various exchanges. This share went down to 16% of total value of trade in 2013-2014. This sheds light on the deviation from the very objective for which commodity derivatives were evolved.

Various new initiatives were coined to regulate the default on exchanges and maintaining the transparency of trade as stated below

1. Setup of Settlement of guarantee fund and Investor Protection Fund to safeguard against default by exchanges. Settlement Guarantee Fund was operationalized in 2013 and all exchanges together contributed nearly Rs. 460.13 crore to the fund.

2. Approval of continuous trading in futures contracts instead of yearly approvals

3. Introduction of staggered delivery mechanism in future contracts on exchanges. This mechanism enables the participant to declare the intention to take delivery at least 15 days before the expiry of the contract. This would reduce excessive speculation and make near month contracts more delivery oriented.

4. Representation of all classes of shareholders on the board of national exchanges to promote and strengthen the corporate governance

5. Technological advancements in commodity exchange led to the issuance of guidelines on carrying out algorithmic trading at National stock exchanges. The practice of sending SMS and Email alert to clients for all the transactions executed in their accounts is a powerful initiative to curb unauthorized trade and will lead to better sharing of information.

6. Set up of Risk management group to monitor and assist in framing policies for management of risk on exchanges.

7. To encourage delivery based trades and incentivize real hedgers to participate actively in the market; the forward market commission has notified exchanges to exempt the traders who has deposited the certified goods with the exchange accredited warehouses for all the future sell
contract and have given delivery intention; from the payment of initial, additional and special margin.

1.6 Structure and Regulation of Commodity Derivative Exchange

Commodity Exchanges in India were regulated until 2015 by Forward Market Commission (FMC) setup under the Forward Contracts (Regulation) Act, 1952. FMC has its head office in Mumbai and was regulated by Ministry of Consumer Affairs, Food and Public Distribution department. Earlier the trade in forwards and futures market was primarily confined to food products and hence the Department of Food and administration was the major regulator for the commission. FMC was time and again felt to have played advisory and monitoring roles as against the role to be played as full-fledged market regulator. The limited regulatory powers enjoyed by FMC were considered to be the major factor behind the recent scam at National Spot Exchange Limited (NSEL).

Merger of FMC with Securities and Exchange Board of India (SEBI, the stock market regulator) was debated over more than a decade. Many committees had suggested the merger of two regulators starting with the Habibullah committee in 2003, the Percy Mistry committee in 2007 and Raghuram Rajan committee in 2009.((Habibullah, 2003), (Percy, 2007), (Raghuram, 2009)). Last in the thread was recommendation by Financial Sector Legislative Reforms Committee headed by B. N. Srikrishna. All the committees recommended stronger regulator for the commodities market in India and looked at this as a way forward to gain economies of scale.

A landmark judgement was taken by the existing Government in 2015 by announcing the merger of Forward Market Commission with SEBI. To make this effective; Finance Act 2015 provided for amending the Securities Contracts (Regulation) Act, 1956 (SCRA) and the Forward Contracts (Regulation) Act, 1952 (FCRA). Forward Contracts (Regulation) Act, 1952 (FCRA) was repealed w.e.f. September 29, 2015 giving way to the long awaited merger. The Union Government notified the merger to be effective from 28, September 2015.

This merger is expected to open up the commodity trade to wider participation which is currently restricted. SEBI has promised to open the market for foreign institutional investors and banks. The convergence will also help track the movement of money and also integrate trading of stock, debt instruments, bonds, currency and commodities. Managing margins of trade and fund transfer from broker to trader would become faster and compliance of regulatory norms would simplify. More liquidity and depth can be expected in the commodity space with allowing of products like options.
and commodity index investing; which at present is prohibited. All these initiatives would help the commodity derivatives market to play the most expected role of price discovery and risk management.

The current structure of commodities derivatives market can be explained with the help of following chart which may be refined further with clarity and subdivision of roles by the regulator.

**Figure 1-1 Structure of Commodity Derivatives Market in India Post the FMC-SEBI Merger**

1.7 Commodity Exchanges in India

At present, India has national level and regional level exchanges. The list of exchanges is produced in figure below. National level exchanges are permitted to trade in various commodities including Bullion (Gold, Silver), Base metals (Copper, Zinc, nickel, etc.), agriculture commodities (cereals, spices, oil seeds, etc.), energy products (crude oil, natural gas, etc.), etc. The Regional exchanges trade only in limited commodities for which they were constituted and cater to region specific trade requirements. The health of many regional exchanges is poor due to low volumes and liquidity.
Together these National level exchanges contributed approximately 99% of the total value of the commodities traded during 2013-2014 (Forward Market Commission update on 19/09/2014). Major group of commodities traded during the year 2013-2014 and their % share is given in the figure 1.2 below. Multi Commodity Exchange, India mainly deals with non-agricultural commodities such as energy, precious metals, base metals etc. whereas National Commodity and Derivatives Exchange of India primarily deals in agricultural commodities such as pulses, cereals, oil and oil seeds, spices and non-edible agricultural products (Sahoo & Kumar, 2008).

<table>
<thead>
<tr>
<th>National Exchanges</th>
<th>Regional Exchanges</th>
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<tbody>
<tr>
<td>• Multi-Commodity Exchange of India Limited, Mumbai (MCX) established in 2003</td>
<td>• Bikaner Commodity Exchange Ltd., Bikaner</td>
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<tr>
<td>• National Commodity and Derivatives Exchange of India, Mumbai (NCDEX) established in 2003</td>
<td>• Bombay Commodity Exchange Ltd., Vashi</td>
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<td>• Indian Commodity Exchange Limited, New Delhi (ICE)</td>
<td>• Chamber Of Commerce, Hapur</td>
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<td>• National Multi Commodity Exchange of India, Ahmedabad (NMCE)</td>
<td>• Central India Commercial Exchange Ltd., Gwalior</td>
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<td>• ACE Derivatives &amp; Commodity Exchange Limited, Mumbai</td>
<td>• Cotton Association of India, Mumbai</td>
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<tr>
<td>• Universal Commodity Exchange Limited, Navi Mumbai</td>
<td>• East India Jute &amp; Hessian Exchange Ltd., Kolkata</td>
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<td>• First Commodities Exchange of India Ltd, Kochi</td>
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<td>• Haryana Commodities Limited, Sirsa</td>
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<td>• India Pepper and Spice Trade Association, Kochi</td>
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<td>• Meerut Agro Commodities Exchange Co. Ltd., Meerut</td>
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<td>• National Board of Trade, Indore</td>
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<td>• Rajkot Commodity Exchange Ltd, Rajkot</td>
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<td>• Rajdhani Oils and Oilseeds Exchange Ltd., Delhi</td>
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<td>• Surendra-nagar Cotton oil &amp; Oilseeds Association Ltd</td>
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<td>• Spices and Oilseeds Exchange Ltd, Sangli</td>
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<td>• Vijay Beopar Chamber Ltd., Muzaffarnagar</td>
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1.8 Issue of Volatility in Commodity Derivative Markets: Problem Statement and Need for the Study

Volatility in prices of commodities is a pressing problem faced by many countries of the world and becomes more daunting issue for developing economies. Volatility as defined by Investopedia as “a statistical measure of the dispersion of returns for a given security or market index”. It can be measured can by use of standard deviation, variance and coefficient of variance. The issue of price volatility in agriculture commodities is of wide interest for the producers, traders, formulators of agriculture policy and regulators at large.

Wide fluctuations in the agriculture prices coupled with oil prices during 2006-2008 world over were seen as threat leading to civil war and political unrest. Excessive speculation and manipulative practices were criticized as hampering the role of price discovery by the derivative exchanges. The dramatic rise in food price led to the riots and social unrest in many poor countries. India also felt the heat of spike in food prices leading to rise in inflation. The “Food-Fuel-Financial” crisis resulted in social unrest and economic instability which in turn drew the attention of Government and policy makers towards Future market. Prolonged heated debates on this issue were discussed amongst the G20 countries and other policy and regulatory forums suggesting certain reforms. However, all these efforts are still away from stabilizing the price of agriculture commodities. In India, Government again banned futures trading on many commodities in an attempt to control food inflation. Price discovery is the most important economic function of the futures market. The process of price
discovery is believed to be disturbed by excessive financialization of commodity markets. Excessive speculation can be understood with low level of delivery interest in futures market compared to the volumes traded on the exchange. The total volume of trade across all Indian commodity exchanges was 140,257 million metric tonnes as against the deliveries of merely 888,250 metric tonnes – a meagre fraction was in delivery based trade (Mahajan & Singh, 2015). Wide literature hints towards the various other factors which may result in volatility in prices like change in the policies, introduction of taxes and duties, macro-economic forces of changes in exchange rates, fluctuations in financial markets, volatility in crude prices to state a few amongst many others.

There is thus a pressing need to identify the factors responsible for wide volatility in agriculture prices. The current study address this issue by finding the lead lag relationship between spot and future price returns as a measure of price discovery role. This is expected to unearth the presence of arbitrage opportunity (if any) in the two markets. The researcher further explores whether the volatility in certain macro-economic factors were responsible for volatility in food prices. These relationships are not static in nature and could have undergone a change with happening of certain events ((Hernandez & Torero, 2010), (Maheu & Gordon, 2008), (Jin & Miljkovic, 2010)). The study attempts to analyze the events that might be at the root cause of the change in this relationship over the period. This entire effort of the researcher is aimed to suggest the strategies when dealing with volatility in agriculture commodities which are considered to be a very important and sensitive issue.

1.9 Justification of Study

As discussed earlier, the issue of volatility in commodity prices is of immense importance from economic as well as social wellbeing of a country. Present study may be justified based on the following grounds:

- India is amongst the world’s largest producer, consumer, and exporter of many agriculture commodities. All the commodities under study have well established cash markets.

- Reintroduction of futures market in 2003 by the Government of India and availability and increase of many contracts for trade and hedging in the agriculture commodities led to the need of testing about efficient market hypothesis of Futures market.
• Since the primary reason for establishment of Futures market is risk management and price discovery; the lead-lag study helps to empirically establish the price discovery role.

• Testing structural breaks which is not widely used for agriculture commodities in India would help to explore vital attributes about the agriculture commodity market. Further the test of nonlinearity of data would further help to reveal true nature of the time series and give clear picture about causality.

• Testing causality with macro-economic variables would reveal the impact that these variables have on the commodity prices and will help to give objective suggestions to the Government for making policy decisions and to see if any investment strategies can be recommended.

Agricultural sector is intertwined with many other sectors and constitutes a major contribution to economic activity (Zainudin, 2009). Changes in the levels of economic activity and other factors would have a direct impact on the agricultural sector. The present study contributes to the existing literature in many of the ways. At first, to the best of researcher’s knowledge, the structural breaks in agriculture commodities are the least researched area in Indian context. More focus has been given on testing of breaks in the macro economic variables like GDP, Inflation, interest rates etc. and agriculture sector is largely ignored. Secondly, identification of breaks in studying the lead-lag relationship between variables under study would help in designing appropriate empirical models taking the breaks in to account to enhance the forecast accuracy.

1.10 Research Objectives

The present study focus on following broad objectives

i. To find the structural breaks in the price of agriculture commodities viz. Soy Bean, Chana and Turmeric and to find the probable reasons that caused the occurrence of break in the time-series.

ii. To find the linear and nonlinear flow of causality between spot and future markets of the agriculture commodities and study market efficiency with reference to the lead-lag relationship between spot and futures price of agriculture commodities.
iii. To study the impact of stock market Index (BSE-Sensex) on spot and future prices of the commodities under study.

iv. To study the impact of Crude on the performance of spot and future price of commodity under study.

v. To study the impact of USD to INR exchange rate (Forex) on the spot and future prices of the agriculture commodity.
References


